

FORM PTO-1449  
(REV.7-80)U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICEATTY. DOCKET NO.  
481112.410APPLICATION NO.  
09/151,409APPLICANT  
James B. DaleFILING DATE  
September 10, 1998GROUP ART UNIT  
1645

## INFORMATION DISCLOSURE STATEMENT

(Use several sheets if necessary)

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PATENT & TRADEMARK OFFICE

## U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE
				IF APPROPRIATE		
LL	AA 4,284,537	08/18/81	Beachey	260	6	
	AB 4,454,121	06/12/84	Beachey	424	177	
	AC 4,521,334	06/04/85	Beachey	260	112.5 R	
	AD 4,597,967	07/01/86	Beachey	424	88	
	AE 4,705,684	11/10/87	Beachey	424	88	
	AF 4,784,984	11/15/88	Yamanaka et al.	502	439	
↓	AG 5,124,153	06/23/92	Beachey et al.	424	93	
AH						
AI						
AJ						
AK						

## FOREIGN PATENT DOCUMENTS

	DOCUMENT NUMBER	DATE	COUNTRY	TRANSLATION	
				YES	NO
LL	AL WO 94/06421	03/31/94	PCT		
	AM				
	AN				
	AO				
	AP				

## OTHER PRIOR ART (Including Author, Title, Date, Pertinent Pages, Etc.)

LL	AQ	Ada, <i>Fundamental Immunology</i> , William E. Paul, M.D. (ed.), 2 <sup>nd</sup> Edition, Raven Press, New York, 1989, pp. 1010-1011.
LL	AR	Baird et al., "Epitopes Of Group A Streptococcal M Protein Shared With Antigens Of Articular Cartilage And Synovim," <i>The Journal Of Immunology</i> 146(9):3132-3137, 1991.
LL	AS	Beachey and Ofek, "Epithelial Cell Binding Of Group A Streptococci By Lipoteichoic Acid On Fimbriae Denuded Of M Protein," <i>The Journal Of Experimental Medicine</i> 143:759-771, 1976.

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<b>INFORMATION DISCLOSURE STATEMENT</b> <i>(Use several sheets if necessary)</i>		APPLICANT James B. Dale	
		FILING DATE September 10, 1998	GROUP ART UNIT 1645

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**OTHER PRIOR ART** *(Including Author, Title, Date, Pertinent Pages, Etc.)*

L L	AC	• Beachey and Seyer, "Protective And Nonprotective Epitopes Of Chemically Synthesized Peptides Of The NH <sub>2</sub> -Terminal Region Of Type 6 Streptococcal M Protein," <i>The Journal Of Immunology</i> 136(6):2287-2292, 1986.
	AD	• Beachey and Seyer, <i>Seminars in Infectious Disease. Volume IV Bacterial Vaccines</i> , Thieme-Stratton Inc., New York, New York, 1982, Chapter Fifty-Seven, "Primary Structure And Immuno-Chemistry Of Group A Streptococcal M Proteins," pp. 401-410.
	AE	• Beachey and Stollerman, "Mediation of Cytotoxic Effects of Streptococcal M Protein by Nontype-Specific Antibody in Human Sera," <i>The Journal of Clinical Investigation</i> 52:2563-2570, 1973.
	AF	• Beachey and Stollerman, "Toxic Effects Of Streptococcal M Protein On Platelets And Polymorphonuclear Leukocytes In Human Blood," <i>The Journal Of Experimental Medicine</i> 134:351-365, 1971.
	AG	• Beachey et al., "Human Immune Response To Immunization With a Structurally Defined Polypeptide Fragment Of Streptococcal M Protein," <i>J. Exp. Med.</i> 150:862-877, 1979.
	AH	• Beachey et al., "Immunogenicity In Animals And Man Of A Structurally Defined Polypeptide Of Streptococcal M Protein," <i>Transactions Of The Association Of American Physicians, Volume XCII</i> :pp.346-354, 1979.
	AI	• Beachey et al., "Opsonic Antibodies Evoked By Hybrid Peptide Copies Of Types 5 and 24 Streptococcal M Proteins Synthesized In Tandem," <i>J. Exp. Med.</i> 163: 1451-1458, 1986.
	AJ	• Beachey et al., "Peptic Digestion of Streptococcal M Protein. II. Extraction of M Antigen from Group A Streptococci With Pepsin," <i>Infection And Immunity</i> 9(5):891-896, 1974.
	AK	• Beachey et al., "Primary Structure of Protective Antigens of Type 24 Streptococcal M Protein," <i>The Journal Of Biological Chemistry</i> 255(13):6284-6289, 1980.
↓	AL	• Beachey et al., "Protective Immunogenicity And T Lymphocyte Specificity Of A Trivalent Hybrid Peptide Containing NH <sub>2</sub> -Terminal Sequences Of Types 5, 6, And 24 M Proteins Synthesized In Tandem," <i>The Journal Of Experimental Medicine</i> 166:647-656, 1987.

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## OTHER PRIOR ART (Including Author, Title, Date, Pertinent Pages, Etc.)

LL	AC	• Beachey et al., "Purification And Properties Of M Protein Extracted From Group A Streptococci With Pepsin: Covalent Structure Of The Amino Terminal Region Of Type 24 M Antigen," <i>The Journal Of Experimental Medicine</i> 145:1469-1483, 1977
	AD	• Beachey et al., "Repeating Covalent Structure and Protective Immunogenicity of Native and Synthetic Polypeptide Fragments of Type 24 Streptococcal M Protein," <i>The Journal Of Biological Chemistry</i> 258(21):13250-13257, 1983.
	AE	• Beachey et al., "Repeating covalent structure of streptococcal M protein," <i>Proc. Natl. Acad. Sci. USA</i> 75(7):3163-3167, 1978.
	AF	• Beachey et al., "Separation Of The Type Specific M Protein From Toxic Cross Reactive Antigens Of Group A Streptococci," <i>Transactions Of The Association Of American Physicians. Ninetieth Session Volume XC</i> : pp. 390-400, 1977.
	AG	• Beachey et al., "Type-specific protective immunity evoked by synthetic peptide of <i>Streptococcus pyogenes</i> M Protein," <i>Nature (London)</i> 292:457-459, 1981.
	AH	• Blenden et al., "Growth of <i>Listeria monocytogenes</i> in a Corn Silage Extract Medium," <i>American Journal Of Veterinary Research</i> 29(11):2237-2242, 1968.
	AI	• Bricas et al., "Structure Et Synthese De La Subunite Peptide De La Paroi De Trois Bacteries Gram-Postif." <i>Peptides. Proceedings of the Eight European Peptide Symposium September 1966, Noordwijk, Neth.</i> , North-Holland Publishing Company: Amsterdam, Neth. And Interscience Publishers Division, John Wiley and Sons, Inc., New York, 1967, 286-292 (+ <i>Biological Abstracts</i> 50(4):Abstract No. 20361, 1936).
	AJ	• Bronze et al., "Protective And Heart-Cross Reactive Epitopes Located Within The NH <sub>2</sub> Terminus Of Type 19 Streptococcal M Protein," <i>The Journal Of Experimental Medicine</i> 167:1849-1859, 1988.
	AK	• Chou and Fasman, "Prediction of Protein Conformation," <i>Biochemistry</i> 13(2):222-245, 1974.
↓	AL	• Cunningham and Beachey, "Peptic Digestion of Streptococcal M Protein. I. Effect of Digestion at Suboptimal pH upon the Biological and Immunochemical Properties of Purified M Protein Extracts," <i>Infection And Immunity</i> 9(2):244-248, 1974.

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**U.S. PATENT DOCUMENTS**

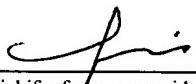
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**OTHER PRIOR ART** *(Including Author, Title, Date, Pertinent Pages, Etc.)*

LL	AC	Cunningham et al., "Human And Murine Antibodies Cross-Reactive With Streptococcal M Protein And Myosin Recognize The Sequence Gln-Lys-Ser-Lys-Gln In M Protein," <i>The Journal Of Immunology</i> 143(8):2677-2683, 1989.
	AD	Dale, "Group A Streptococcal Vaccines," <i>New Vaccines And New Vaccine Technology</i> 13(1):227-243, 1999.
	AE	Dale, "Group A Streptococcal Vaccines," <i>Pediatric Annals</i> 27:301-308, 1998.
	AF	Dale, "Multivalent group A streptococcal vaccine designed to optimize the immunogenicity of six tandem M protein fragments," <i>Vaccine</i> 17:193-200, 1999.
	AG	Dale and Beachey, "Epitopes Of Streptococcal M Proteins Shared With Cardiac Myosin," <i>The Journal Of Experimental Medicine</i> 162:583-591, 1985.
	AH	Dale and Beachey, "Multiple, Heart-Cross-Reactive Epitopes Of Streptococcal M Proteins," <i>Journal Of Experimental Medicine</i> 161:113-122, 1985.
	AI	Dale and Beachey, "Sequence Of Myosin-Crossreactive Epitopes Of Streptococcal M Protein," <i>Journal Of Experimental Medicine</i> 164:1785-1790, 1986.
	AJ	Dale and Beachey, "Localization Of Protective Epitopes Of The Amino Terminus Of Type 5 Streptococcal M Protein," <i>The Journal Of Experimental Medicine</i> 163:1191-1202, 1986.
	AK	Dale et al., "Blastogenic Responses Of Human Lymphocytes To Structurally Defined Polypeptide Fragments Of Streptococcal M Protein," <i>The Journal Of Immunology</i> 126(4):1499-1505, 1981.
↓	AL	Dale et al., "Heterogeneity Of Type-Specific And Cross-Reactive Antigenic Determinants Within A Single M Protein Of Group A Streptococci," <i>The Journal Of Experimental Medicine</i> 151:1026-1038, 1980.

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L L	AC	Hollingshead et al., "Complete Nucleotide Sequence of Type 6 M Protein of the Group A Streptococcus," <i>The Journal Of Biological Chemistry</i> 261(4):1677-1686, 1986.
	AD	Hopp and Woods, "Prediction of protein antigenic determinants from amino acid sequences," <i>Proc. Natl. Acad. Sci. USA</i> 78(6):3824-3828, 1981.
	AE	Jones et al., "Differential Effects Of Antibodies To Lyt-2 And L3 T4 On Cytolysis By Cloned, Ia-Restricted T Cells Expressing Both Proteins," <i>The Journal Of Immunology</i> 139(2):380-384, 1987.
	AF	Kang, "Studies on the Location of Intermolecular Cross-Links in Collagen. Isolation of a CNBr Peptide Containing δ-Hydroxylysinoornithine," <i>Biochemistry</i> 11(10):1828-1835, 1972.
	AG	Kang and Gross, "Amino Acid Sequence of Cyanogen Bromide Peptides from the Amino-Terminal Region of Chick Skin Collagen," <i>Biochemistry</i> 9(4):796-804, 1970.
	AH	Kaplan et al., "Group A Streptococcal Serotypes Isolated from Patients and Sibling Contacts During the Resurgence of Rheumatic Fever in the United States in the Mid-1980s," <i>The Journal Of Infectious Diseases</i> 159(1):101-103, 1989.
	AI	Koch et al., "Purification And Structural Analysis Of Streptolysin S (SLS)," <i>Federation Proceedings</i> 42(7): p. 1810, Abstract No. 309, 1983.
	AJ	Kraus et al., "Identification Of An Epitope Of Type 1 Streptococcal M Protein That Is Shared With A 43-kDa Protein Of Human Myocardium And Renal Glomeruli," <i>The Journal Of Immunology</i> 145(12):4089-4093, 1990.
	AK	Kraus et al., "Sequence And Type-Specific Immunogenicity Of The Amino-Terminal Region Of Type 1 Streptococcal M Protein," <i>The Journal Of Immunology</i> 139(9):3084-3090, 1987.
↓	AL	Lancefield, "Persistence Of Type-Specific Antibodies In Man Following Infection With Group A Streptococci," <i>J. Exp. Med.</i> 110:271-292, 1959.

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LL	AC	Laver et al., "Antigenic drift in type A influenza virus: Peptide mapping and antigenic analysis of A/PR/8/34 (HON1) variants selected with monoclonal antibodies," <i>Proc. Natl. Acad. Sci. USA</i> 76(3):1425-1429, 1979.
	AD	Lockey, "Urticaria of Unknown Origin," <i>Hospital Practice</i> : pp. 49-57, 1979.
	AE	Manjula and Fischetti, "Tropomyosin-Like Seven Residue Periodicity In Three Immunologically Distinct Streptococcal M Proteins And Its Implications For The Antiphagocytic Property Of The Molecule," <i>J. Exp. Med.</i> 151:695-708, 1980.
	AF	Miller et al., "Antigenic Variation among Group A Streptococcal M Proteins," <i>The Journal Of Biological Chemistry</i> 263(12):5668-5673, 1988.
	AG	Miller et al., "Conservation of Protective and Nonprotective Epitopes in M Proteins of Group A Streptococci," <i>Infection And Immunity</i> 56(8):2198-2204, 1988.
	AH	Mouw et al., "Molecular Evolution of Streptococcal M Protein: Cloning and Nucleotide Sequence of the Type 24 M Protein Gene and Relation to Other Genes of <i>Streptococcus pyogenes</i> ," <i>Journal Of Bacteriology</i> 170(2):676-684, 1988.
	AI	Phillips, Jr. et al., "Streptococcal M protein: $\alpha$ -Helical coiled-coil structure and arrangement on the cell surface," <i>Proc. Natl. Acad. Sci. USA</i> 78(8):4689-4693, 1981.
	AJ	Podbielski et al., "Application of the polymerase chain reaction to study the M protein(-like) gene family in beta-hemolytic streptococci," <i>Med. Microbiol. Immunol.</i> 180:213-227, 1991.
	AK	Rijn et al., "Group A Streptococcal Antigens Cross-Reactive With Myocardium," <i>The Journal of Experimental Medicine</i> 146:579-599, 1977.
↓	AL	Robbins et al., "Streptococcus pyogenes Type 12 M Protein Gene Regulation by Upstream Sequences," <i>Journal Of Bacteriology</i> 169(12):5633-5640, 1987.

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L L	AC	Sargent et al., 'Sequence Of Protective Epitopes Of Streptococcal M Proteins Shared With Cardiac Sarcolemmal Membranes,' <i>The Journal Of Immunology</i> 139(4):1285-1290, 1987.
	AD	Seyer and Kang, "Covalent Structure of Collagen: Amino Acid Sequence of Cyanogen Bromide Peptides from the Amino-Terminal Segment of Type III Collagen of Human Liver," <i>Biochemistry</i> 16(6):1158-1164, 1977.
	AE	Seyer et al., "Primary Structural Similarities Between Types 5 And 24 M Proteins Of Streptococcus pyogenes," <i>Biochemical And Biophysical Research Communications</i> 92(2):546-553, 1980.
	AF	Smithies et al., "Quantitative Procedures for Use with the Edman-Begg Sequenator. Partial Sequences of Two Unusual Immunoglobulin Light Chains, Rzf and Sac," <i>Biochemistry</i> 10(26):4912-4921, 1971.
	AG	Vashishtha et al., Reactivity of Antisera to Peptides Corresponding to the C-repeat Region of Streptococcal M Protein with Mammalian Coiled-Coil Proteins," <i>Abstracts Of The 91st General Meeting of the Society for Microbiology</i> 1991:p. 129, Abstract No. E-66, 1991
	AH	Weigent et al., "Induction of Human Gamma Interferon by Structurally Defined Polypeptide Fragments of Group A Streptococcal M Protein," <i>Infection And Immunity</i> 43(1):122-126, 1984.
	AI	Wistedt et al., "Identification of a plasminogen-binding motif in PAM, a bacterial surface protein," <i>Molecular Microbiology</i> 18(3): 569-578, 1995.
V	AJ	International Search Report, PCT Patent Application No. PCT/US98/19100, February 24, 1999.
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